

Discovery of 100 TeV gamma-rays from HESS J1702-420: a new PeVatron candidate

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The identification of active PeVatrons, hadronic particle accelerators reaching the knee (at the energy of few PeV), is crucial to understand the origin of cosmic rays in the Galaxy. In this context, we report on new H.E.S.S. observations of the PeVatron candidate HESSJ1702-420, close to the source 2FHL J1703.4-4145, that have revealed the presence of gamma-rays up to 100 TeV at 5 sigma confidence level. This is the first time in H.E.S.S. history that photons with such high energy are clearly detected. Remarkably, the new deep observations allowed the discovery of a new gamma-ray source component, called HESS J1702-420A, that was previously hidden under the bulk emission traditionally associated with HESSJ1702-420. This new object has a power-law spectral slope < 2 and a gamma-ray spectrum that, extending with no sign of curvature up to 100 TeV, makes it an excellent candidate site for the presence of extremely high-energy cosmic rays. This discovery brings new information to the open debates on the nature of the unidentified source HESSJ1702-420, one of the most compelling PeVatron candidates in the gamma-ray sky, and on the origin of Galactic cosmic rays.

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